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# PULP & PAPER

July 1987

PULP & PAPER

JULY 1987 Pulpwood Processing • Power/Steam Vol. 61, No. 7

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**PULPWOOD PROCESSING:**
Update on fiber supply, processing, genetics

**POWER/STEAM:**
New energy alternatives; Recovery boiler tube survey **119**

Volume 61
Number 7

# JULY

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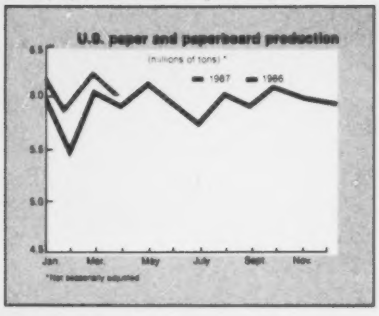
**U.S. paper and board production**




**U.S. production** of paper and paperboard totaled 6.0 million tons in April, up 2.7% from the same month last year, according to American Paper Institute data. The seasonally adjusted production trend rate for April stood at 72.4 million tpy, up 4.1% compared with last year but down slightly from the first-quarter rate of 72.5 million tpy. Paperboard continued to show the most strength, with the trend rate running 5.7% ahead of last year's pace. The April trend rate for paper was 2.5% ahead of last year.

**Among major grades**, a rebound in coated papers led the way in the paper sector. Heavy demand also boosted imports of coated paper 29% compared with 1986, API said, with most of the increase coming from Canada. Heavy containerboard demand was reflected in another record month for fiber box shipments, while folding boxboard production climbed 7.0% above year-earlier levels.

**Canadian newsprint shipments** in April totaled 818,000 tons, up 2.3% from last year, while the operating rate jumped to 99%. Woodpulp production was off 4.0% compared with last April, although the operating rate climbed to 98% for the month. ■

| | Latest month (000 short tons) | | % change from year ago | Annualized year-to-date (000 short tons) | % change from year ago |
|---|---|---|---|---|---|
| **PAPER & PAPERBOARD PRODUCTION[1]** | | | | | |
| Newsprint | Apr. | 462.0 | 2.4 | 5,605.0 | 1.7 |
| Uncoated groundwood (s) | Apr. | 121.0 | −4.7 | 1,549.0 | 1.2 |
| Coated paper (s) | Apr. | 539.0 | 5.7 | 6,547.0 | 7.9 |
| Uncoated free sheet (s) | Apr. | 892.0 | 4.2 | 10,575.0 | 2.7 |
| Other printing/writing | Apr. | 112.0 | −0.9 | 1,389.0 | −0.3 |
| Total packaging and other paper (s) | Apr. | 424.0 | -4.3 | 5,227.0 | 0.3 |
| Tissue | Apr. | 404.0 | -4.3 | 5,076.0 | −0.2 |
| **Total paper** | **Apr.** | **2,960.0** | **1.3** | **35,968.0** | **2.5** |
| Unbleached kraft paperboard | Apr. | 1,368.0 | −3.9 | 16,610.0 | 5.1 |
| Semichemical medium | Apr. | 460.0 | 3.8 | 5,614.0 | 7.5 |
| Bleached paperboard | Apr. | 366.0 | 1.4 | 4,440.0 | 3.5 |
| Recycled paperboard | Apr. | 741.0 | 6.3 | 8,756.0 | 6.5 |
| **Total paperboard** | **Apr.** | **3,049.0** | **4.2** | **36,845.0** | **5.7** |
| **Total U.S. paper and paperboard output** | **Apr.** | **6,009.0** | **2.7** | **72,813.0** | **4.1** |
| **PULP, WASTEPAPER & FIBER[2]** | | | | | |
| Total U.S. woodpulp production | Mar. | 5,031.0 | 3.9 | 58,934.0 | 4.6 |
| Market pulp production | Mar. | 686.0 | 7.9 | 7,795.0 | 5.4 |
| Wastepaper consumption at paper/board mills | Mar. | 1,380.0 | −2.3 | 17,188.0 | 3.2 |
| Pulpwood consumption (cords) | Mar. | 7,869.0 | 7.9 | 93,836.0 | 3.7 |
| **CONVERTED PRODUCTS STATISTICS[3]** | | | | | |
| Corrugated box shipments (billion ft²) | Apr. | 25.591 | 1.2 | 97.758[6] | 5.0 |
| Containerboard inventories at U.S. box plants and mills | Apr. 1 | 2,408.0 | −4.3 | | |
| **INTERNATIONAL TRADE[2]** | | | | | |
| U.S. paper imports (including products) | Mar. | 1,063.0 | 12.5 | 12,412.0 | 9.1 |
| Imports of Canadian newsprint | Mar. | 728.0 | 4.3 | 8,707.0[6] | 5.5 |
| U.S. paper exports (including products) | Mar. | 427.0 | 2.6 | 5,009.0 | 11.1 |
| Exports of unbleached kraft linerboard | Mar. | 187.0 | 2.2 | 2,257.0 | 19.6 |
| Exports of woodpulp | Mar. | 471.0 | 13.8 | 4,509.0 | 2.3 |
| Norscan pulp inventories[4] | Apr. 30 | 913.0 | −10.9 | | |
| Norscan pulp operating rates[4] | Apr. | 101% | 99% | 100% | 99% |
| **CANADIAN STATISTICS[5]** *(reported in metric tons)* | | | | | |
| Total newsprint shipments | Apr. | 818.0 | 2.3 | 3,169.0[6] | 7.0 |
| Operating rates | Apr. | 99% | 92% | 99% | 92% |
| Inventories held by U.S. consumers | Apr. 30 | 1,371.0 | −2.7 | | |
| Other paper/board shipments | Apr. | 536.0 | 0.9 | 2,115.0 | 6.6 |
| Woodpulp shipments (export only) | Apr. | 623.0 | −4.0 | 2,616.0 | 2.6 |
| Operating rates | Apr. | 98% | 88% | 98% | 89% |

1. American Paper Institute. 2. API, Bureau of Census, American Pulpwood Assn. 3. Fibre Box Assn., Paperboard Packaging Council. 4. North American/Scandinavian paper-grade market pulp. 5. Canadian Pulp & Paper Assn. 6. Not annualized. (s) = Shipments.

# RECYCLED PAPERBOARD: Flat capacity helps market

**Grade structure:** Recycled paperboard is made primarily from secondary fiber and is produced on either a fourdrinier or multi-ply paper machine. Grades include the following: boxboard, corrugating medium, linerboard, gypsum liner, and core/can/tube stock.

**Production/capacity:** Production jumped 11.1% to 8.14 million short tons in 1986 from 1985. Demand fell off somewhat at year-end but continued to build through the first quarter of 1987, with recycled folding boxboard production up 8.3% compared with a year earlier.

Capacity increased just 1.7% in 1986 from the previous year, resulting in tightening supply levels as demand shot up more than 6.7%. Mills operated at 91.0% of capacity compared with 86.8% a year earlier. This year, capacity is expected to rise 2.5% to 9.17 million short tons, which should keep mills running at about a 92.7% rate.

Uncertainty over some idled capacity, however, could change this picture within a short period. The Riegelsville, Pa., mill of International Paper Co. and the Clifton, N.J., mill of V. Ponte & Sons have been idle for two years.

**Outlook:** Recycled board producers have been trying to raise prices in 1987, not only due to rising costs for wastepaper and energy, but also because of improving market conditions.

West Coast producers set the pace early in the year, announcing a hike of about 4% to 6% or $20 to $25 in that region. Prices were raised as slated through Apr. 1, marking the first increase on the West Coast in two years. This was followed by major producers in the East announcing a $20 to $40 increase, taking effect through June 1.

With production for the year expected to be up about 4.5% from 1986 to 8.5 million tons, producers were optimistic that prices would go up in 1987.

Capacity additions slated for the year were also favorable to continued market stability. According to API estimates, 394,000 tons are scheduled to come online through 1989.

This should keep markets for such uses as boxboard for folding cartons firm this year. Limited capacity in competing materials, such as solid bleached sulfate and unbleached kraft board, will also reduce any market loss from these grades. Setup boxboard demand should also remain good this year due to continued interest in specialty products, according to Dept. of Commerce forecasts.

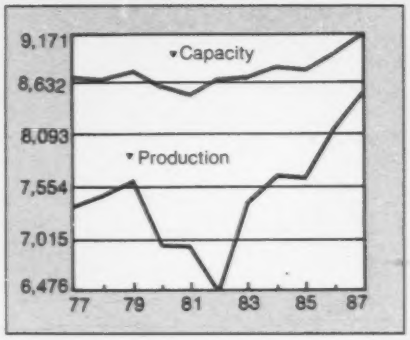
Gypsum liner consumption has been strong in recent years, due to robust construction activity, and is expected to remain relatively firm in 1987. Rising interest rates in the second quarter, however, could possibly weaken demand later in the year.

**Prices:** Competitive markets have depressed recycled boxboard prices since the early 1980s and have caused more variation in regional and individual transaction prices. Prices have been higher in the West and more competitive in the Midwest and eastern U.S. However, prices began to firm late in the year, causing boxboard producers to slate price increases during the first half of 1987. Recycled containerboard prices have generally followed the recovery in kraft linerboard and semichemical medium that began last year. The market for medium, however, remains softer than that for linerboard.

Clay-coated 20-pt folding carton boxboard (rolls), $/short ton, year-end: 1975, $257; 1976, $262; 1977, $284; 1978, $305; 1979, $355; 1980, $380; 1981, $400/425; 1982, $380/425; 1983, $370/425; 1984, $375/425; 1985, $350/400, 1986, $380/420. Bending 20-pt chipboard (rolls), $/short ton, year-end: 1975, $204; 1976, $212; 1977, $219; 1978, $225; 1979, $260; 1980, $260/275; 1981, $270/280; 1982, $280; 1983, $280/300; 1984, $300; 1985, $300; 1986, $320.

**Markets:** Market demand for recycled paperboard grades, measured by their 1987 capacity share, is: folding boxboard, 29.1%; setup boxboard, 3.1%; corrugating medium, 17.2%; gypsum linerboard, 14.4%; linerboard, 6.1%; container chipboard and filler board, 0.5%; other paperboard, 29.6%. ■

## SUPPLY/DEMAND (000 tons)




## FORECAST (000 tons)

| | 1985 | 1986 | 1987e |
|---|---|---|---|
| Production[1] | 7,630 | 8,143 | 8,500 |
| Capacity | 8,795 | 8,948 | 9,171 |
| Utilization rate | 86.8% | 91.0% | 92.7% |
| Imports | 68 | 104 | 200 |
| Exports | 246 | 320 | 250 |
| Apparent U.S. consumption | 7,452 | 7,927 | 8,450 |
| lb/capita | 62.20 | 65.60 | 69.60 |
| GNP ratio | 2.08 | 2.16 | 2.24 |

e = Estimate.
1. American Paper Institute data.

## TOP U.S. PRODUCERS (000 tpy)

| | Annual capacity (000 tons) | Market share (%) |
|---|---|---|
| 1. CCA | 625 | 6.8 |
| 2. Newark Group | 610 | 6.7 |
| 3. Sonoco Products | 600 | 6.5 |
| 4. Jefferson Smurfit | 546 | 6.0 |
| 5. Caraustar Industries | 480 | 5.2 |
| 6. Inland Container | 455 | 5.0 |
| 7. U.S. Gypsum | 377 | 4.1 |
| 8. National Gypsum | 365 | 4.0 |
| 9. Waldorf | 365 | 4.0 |
| 10. Rock-Tenn | 307 | 3.3 |

Market share of top five companies: **31.2**

Market share of top ten companies: **51.8**

Total U.S. capacity (1987): **9.171 million short tons**

field, Ore. They have been working without contracts since the old ones expired Mar. 15 and May 1.

Also in the Northwest, contracts have expired at three other Washington paper mills: Longview Fibre Co.'s mill in Longview, Boise Cascade Corp.'s Steilacoom mill, and Scott Paper Co.'s mill in Everett. Negotiation talks are currently under way with all three companies.

• AWPPW members at **Boise Cascade Corp.**'s mills in Vancouver, and Wallula, Wash., and St. Helens, Ore., and at the converting operation at Salem, Ore., have opened their master bargaining on economic issues, according to a company spokesman. Negotiations up to this point had been concerned with local issues. The old contracts at all four locations expired on Mar. 14.

• Members of the United Paperworkers International Union who are currently negotiating a new contract at **Stone Container Corp.**'s 1,850-tpd linerboard mill at Missoula, Mont., have taken a strike vote, although a ten-day strike notice, required under the terms of the previous contract which expired May 31, has not yet been given. Negotiations are still continuing, according to a company spokesman.

• An industry source has reported the details of a new labor agreement that has been reached between UPIU workers and Stone Container Corp. at the company's 1,750-tpd linerboard mill in Florence, S.C. The pact, which was ratified on May 8, will be effective retroactive to Nov. 1, 1986. It gives lump sum payments of $1,500 to $2,200 in the first year and $1,200 to $1,500 in the second year for day and shift workers, respectively. In the third year, workers will receive a 3% wage increase. In addition, Dec. 24 and 25 were unrestricted; workers who come in on either day will receive double time. The Sunday premium was reduced and will be eliminated entirely on Aug. 1, 1989. Flexibility language was also included. The contract will expire Aug. 31, 1989.

• **Jefferson Smurfit Corp.** has concluded contract negotiations with the UPIU at its 305-tpd recycled board mill in Lockland, Ohio. The new three-year agreement, which is effective retroactive to Nov. 1, 1986, gives union workers wage increases of 2%/2.5%/3% before expiring on Nov. 1, 1989. ■

*SALES/EARNINGS*

## Canadian earnings rose 772% in the first quarter

First-quarter earnings for Canada's paper and forest products industry climbed 772% on increased sales of 13% compared with the first quarter of 1986. Most of the good news can be attributed to improved prices for market pulp and newsprint—the Canadian industry's two biggest exports.

The continued strengthening of the Canadian dollar relative to the U.S. dollar, however, is already cutting into profits. Plus, the unsettled contract with the Canadian Paperworkers Union and the cost of the 15% export fee on softwood lumber going to the U.S. are clouding the picture. But despite these factors, most companies are predicting that 1987 results will be healthy and may even best the 77% improvement in earnings recorded between 1985 and 1986.

MacMillan Bloedel Ltd. has reported first-quarter earnings of C$60.4 million—the highest quarterly result before extraordinary items in the company's history. President and CEO Ray Smith said MB's containerboard and packaging group showed dramatic improvement. He added "We can't lose sight of the scratching and clawing we did to dig ourselves out of the recession that nearly buried us in 1981. We've a lot of catching up to do, so we're committing millions to our shape-up program for manufacturing facilities and preparing for the cycle dips that inevitably hit the forest industry." This year, MB will spend about $70 million at its Powell River Div., Powell River, B.C., and $30 million at the Harmac Div. pulp mill in Nanaimo, B.C. The export tax cost MB about $6 million in the quarter.

Abitibi-Price Inc.'s earnings figure inched up 0.9%. Bernd K. Koken, president and CEO, said improved performance in most of the company's business segments was largely offset by the negative impact of a stronger Canadian dollar. The company estimates that a 1¢ rise in the Canadian dollar trims about $15 million from the company's pretax profit. Abitibi and other Canadian newsprint producers are counting on the July 1 newsprint price hike to help them make up ground lost to the appreciating currency. About 13,000 metric tons of newsprint and groundwood papers were lost due to downtime taken for capital projects during the quarter, the company said.

**Canadian paper/forest products industry first-quarter results.**

| | First quarter 1987 (C$000) | | | |
|---|---|---|---|---|
| **Companies** | **Sales** | **Change 1987/86** | **Earnings[1]** | **Change 1987/86** |
| Abitibi-Price | C$695,700 | 7.5% | C$21,900 | 0.92% |
| B.C. Forest Products | 335,900 | 24.6 | 32,700 | 581.3 |
| Canfor | 294,800 | 8.5 | 20,700 | 840.9 |
| Cascades | 129,011 | 56.4 | 6,391 | 32.0 |
| Consolidated-Bathurst | 533,100 | 17.5 | 33,000[2] | 124.5 |
| Crestbrook Forest | 54,893 | 35.6 | 6,778 | 1,357.6 |
| Crown Forest Industries | 223,200 | 1.9 | 16,400 | 168.9 |
| Domtar | 604,000 | 7.3 | 44,000[2] | 22.2 |
| Donohue | 110,900 | −5.5 | 8,000 | 81.8 |
| Great Lakes FP | 183,111 | 29.2 | 19,658 | 4,282.6 |
| MacMillan Bloedel | 719,400 | 17.3 | 60,400[2] | −18.6 |
| Paperboard Industries (2/28) | 21,657 | 17.7 | 980 | 94.4 |
| Rolland | 95,200 | 17.1 | 1,507 | −29.7 |
| Scott Paper | 75,352 | 4.4 | 3,652 | 4.4 |
| Weldwood | 180,100 | 5.4 | 12,900 | 186.7 |
| West Fraser Timber | 92,700 | 22.3 | 12,000 | 380.0 |
| **Total** | **C$4,349,024** | **13.3%** | **C$300,988** | **772.5 %** |

1. Income after taxes, from continuing operations, excluding most significant nonrecurring items in both years.
2. **Consolidated-Bathurst:** 1986 quarter excludes C$47.4-million write-down of investment in two oil and gas firms. **Domtar:** 1986 quarter includes C$6-million pretax gain. **MacMillan Bloedel:** 1986 quarter includes a C$45-million gain from sale of an investment.

Domtar Inc.'s earnings have increased 22.2% over year-earlier levels. The company's fine paper business has recorded higher profits because of increased selling prices, while the operating profit of the newsprint and groundwood specialties business was lower due primarily to a less favorable U.S. exchange rate, according to Domtar.

Consolidated-Bathurst Inc.'s earnings were more than double those of the year-earlier quarter, and the company expects 1987 results to exceed 1981's level, when Con-Bath earned $101 million. President and CEO Oscar Stangeland said that increased shipments and price hikes in newsprint, market pulp, and containerboard were offset slightly by a stronger Canadian dollar. He estimated that the resurgence of Canada's currency relative to the U.S. dollar cost Con-Bath $4 million in the first quarter. However, the company is predicting that both 1987 and 1988 will be extremely profitable.

British Columbia Forest Products Ltd. had a 531% increase in earnings over year-earlier levels. The only weak area was lightweight coated paper. The market for LWC was under pressure from offshore imports and additional capacity. Strong newsprint and pulp sales have managed to offset this weakness.

Canfor Corp. improved its earnings by 840%—the best quarterly result since the company went public. Canfor expects buoyant markets for pulp and sack kraft paper to continue through this year. In contrast, the lumber market will probably weaken. The company paid $6.5 million in taxes on its softwood lumber exports to the U.S. during the quarter. ■

*EXPANSION/MODERNIZATION*

## Scott will spend $120 million on Muskegon mill

Scott Paper Co. will spend $60 million to rebuild one of two coated freesheet paper machines at its S.D. Warren Div. mill in Muskegon, Mich. This follows a similar recent announcement of a $60-million project to improve the mill's energy generation system.

A company spokesman would not say how much the capacity increase would be, but the mill currently is believed to be rated at 400 to 425 tpd of No. 1 coated paper. When completed in the fall of 1988, stated spokesman Michael Kilpatrick, the rebuilt machine will produce higher quality paper.

Kilpatrick said the mill already is the largest producer of premium coated paper for such end uses as annual reports and high-quality brochures and catalogs.

The 30-month energy system rebuild, originally announced in January, involves replacement of two old boilers with one new cogeneration unit that can burn biomass and pulverized coal. The upgrade is designed to make the mill self-sufficient in electricity generation. ■

## St. Marys orders a new 130,000-tpy sc machine

St. Marys Paper Inc. has chosen Tampella Oy of Finland to supply its previously announced purchase of a supercalendered paper machine at its Sault Ste. Marie, Ont., mill. The machine will produce 130,000 short tpy. Tampella's major competitor was former partner Valmet Oy. This is the firm's first paper machine sale in North America. Previously, Tampella sold only paperboard machines here.

Tampella's new machine is part of a C$141-million project to increase the mill's top capacity to 250,000 tpy. That figure includes refinancing of current debt. The company currently is seeking final financing approval.

No. 1 machine, which may be brought back online when market conditions improve, will be mothballed. No. 1 is the smallest of the mill's four paper machines. After No. 1 is phased out of production, top capacity at the mill will be 217,000 tons.

Bill Hohns, vice president of Tampella Paper Machinery Co., the North American sales arm of Tampella, said the machine will have a hydraulic headbox, twin-wire former, and four presses. The machine has a 184-in.-trim, runs at 4,000 fpm, and will be able to make lower basis-weight papers down to 28 lb. The mill can currently make 31 lb to 40 lb paper.

St. Marys is planning to produce low-filled SC-B paper on the machine, although it has the capability to make premium SC-A paper. The general contractor is Commonwealth Construction of Burnaby, B.C. ■

## Cascades announces two-year Jonquiére upgrade

At Cascades Inc.'s annual meeting, company president Bernard Lemaire announced that his company will spend C$30 million in the next two years to upgrade its mill located in Jonquiére, Que.

The bulk of the money will be used to modify the wet end of the mill's single cylinder machine, which was installed in 1961 and rebuilt in 1974, by adding a three-wire fourdrinier. Improvements will also be made to the dry end, raising No. 1's paperboard capacity from 160 metric tpd to 250 tpd. The upgrade will enable Jonquiére to produce the lighter-weight, three-ply boxboard used in liquid packaging products, Lemaire said.

Jonquiére currently sells about 170 tpd of bleached kraft market pulp. After the rebuild it will market about 120 tpd. In 1986, Cascades invested $2.5 million in the mill to modify the bleaching process and to add a second processing station.

Lemaire also said Cascades has agreed to purchase a 30% share in Cascades (Cabano) Inc. from Rexfor, Quebec's forest industries corporation. The $7.5-million cash purchase will raise Cascades' stake in the Cabano, Que., mill to 95%. Cascades invested $2 million in the mill last year to modify the paper machine and build a maintenance garage. Cabano's semichemical medium capacity increased from 82,000 tpy to 100,000 tpy as a result. ■

*ACQUISITIONS/MERGERS*

## L-P, Daishowa terminate talks over sale of Antioch

Louisiana-Pacific Corp. recently announced that negotiations concerning the sale of its Fibreboard Corp. container division to Daishowa America Co. Ltd. have been terminated.

The $160-million transaction between the two companies would have included the 250,000-tpy Antioch, Calif., containerboard mill and three

# Bleaching chemical supply tightening, prices firmimg

**CHLORO-ALKALI.** The rollercoaster ride of chloro-alkali products is now in a climbing stage. Price increases are holding and supply and demand seem to be balanced for chlorine. The industry attributes a great deal of the record high operating rates (Feb.—92%, Mar.—96%) directly to the healthy demands of pulp producers, particularly for any gains made in caustic soda.

In 1986, shutdowns totaling 2,400 tpd helped balance supply and trim inventories. Plant openings in 1987 include the reopening of OxyChem's Taft, La., diaphragm cell unit and a new plant at Niagara Falls, N.Y. (a joint venture of DuPont and Olin called Niachlor). Installing technologically superior equipment (i.e., in production costs, product uniformity, and purity) has contributed to the profitability of chloro-alkali producers. The Asahi membrane cell process will come online at Niachlor, Brunswick (52,000 tpy in 1988) and three more plants in the Far East. ICI is applying its mono-polar cell to KOH production in England, the first commercial installation of this technology.

OxyChem has completed acquisition of the chloro-alkali assets of Diamond Shamrock. Canadian Oxy recently purchased the chloro-alkali unit at Squamish, B.C., from FMC.

Pulp mills ran at or near full capacity through most of 1986 and 1987 production looks similar. Paper-grade chemical pulp is only scheduled to grow 1% through 1990, split evenly between white and brown pulps. No new greenfield pulp mills are planned, although some studies have been done for linerboard expansion. Chlorine consumption may be threatened in the future, as concern for bleach plant effluent production mounts. One mill has retrofitted an oxygen delignification unit, and three new lines have incorporated it into their expansion projects.

*Pulp & Paper* is conducting a study to determine what alternatives mills will choose should intense chlorination be prohibited by strict environmental regulations (which are in place in one state already). The results will be presented at TAPPI-West.

List prices for chloro-alkali products soared 40% in 1986, and new price increases for this year have taken hold. The increase for chlorine is said to be firming all regional quotes (except for the Midwest), but price erosion of caustic due to oversupply may curtail any large profit jumps.

**CHLORATE.** Demand for sodium chlorate is expected to be stronger in 1987, particularly in the market pulp sector. Despite the adoption of oxidative extraction, chlorine dioxide consumption remains the same. Renewed interest in a high substitution of chlorine dioxide in the chlorination stage has been shown by producers applying short sequences with and without oxygen delignification. There are environmental benefits as well.

The supply of chlorate is ample, even with the phasing out of uneconomical graphite units over the past four years. One or two more units are predicted to shut down, which should assist the remaining U.S. producers to maintain their share against the Canadian shippers who have a production cost advantage (cheaper power). Mills are installing makedown units for delivered crystal products, although mills close to the chlorate source would have no interest in doing so.

The price of chlorate is on the way up. After several depressed years, announced increases have inflated the list, although discounting is common. Kemanord recently announced a price increase for July, and it anticipates the list rising again in early 1988.

**OXIDIZERS.** Peroxide and oxygen have gained wide acceptance during the 1980s. The applications of both in incremental additive roles appear to be leveling. For peroxide, its addition in the extraction stages and enroute to storage falls between 1 and 4 lb/ton. Our survey showed that mills use peroxide for export market pulp and where it can save steam and chemicals. A growth area for peroxide is in established oxidative extraction processes and in sulfite mills where it can assist in first stage delignification (without chlorine).

Interest in oxygen is very high. Its growth has been exponential over the past six years. Consumption may be flattening somewhat with the market for oxidative extraction approaching saturation. The growth curve accelerates each time a new oxygen delignification unit comes online, because those systems use three times as much oxygen as EO systems.

Price is not a big concern for consumers of oxygen. The supply is ample (Airco and Air Products recently installed new gas separation plants), and price increases are not likely in 1987. The list price of peroxide may soon become "unrealistic," with one new plant online (DuPont at Maitland) and another approaching startup (Degussa at Mobile, Ala.).

—*Michael Ducey*

*TABLE 1:* **U.S. and Canadian consumption of chemical pulp bleaching chemicals.**

| U.S. | $Cl_2$ | NaOH[1] | $NaClO_3$ | $H_2O_2$ | $O_2$[2] |
|---|---|---|---|---|---|
| 1986 (000 tons) | 1,680 | 2,534 | 215 | 9 | 80 |
| % change from 1985 | 5% | 7% | 1% | 1% | 20% |
| % change in 1987 | 5% | 8% | 6% | 5% | 18% |
| end 1986 price[3] | 175 | 90 | 300 | 645 | 70 |
| % change 1985 | 40% | 10% | 10% | 0 | 0 |
| % change in 1987 | 15% | 5% | 7% | −10% | 0 |
| Canada[4] | | | | | |
| 1986 (000 kilotonne) | 520 | 930 | 195 | 2 | 42 |
| % change 1985 | 2.7% | 2% | 5% | 10% | 20% |
| % change 1987 | 4% | 4% | 7% | 5% | 10% |

1. Includes uses in pulping.
2. Includes uses in black liquor oxidation, kiln firing, environmental treatment.
3. *Chemical Marketing Reporter* figures ($/ton, standard form, freight equalized).
4. *Corpus Chemical Report*.
Sources for information include Dow USA, Kemanord, DuPont and Interox.

# U.S. PAPER INDUSTRY SUPPLIED MORE THAN 50% OF ENERGY NEEDS IN 1986

## South Atlantic region leads in self-sufficiency, while mills in the Middle Atlantic and North Central regions are lagging behind

**By REGINA McGRATH, Assistant News Editor**

The pulp and paper industry ranks third in energy purchases by U.S. manufacturing industries, after chemicals and primary metals. It consumes the most fuel oil, is the third-largest purchaser of electricity, is third in coal use, and is sixth in natural gas consumption. Spent pulping liquor is the main source of fuel, thanks in large part to the burgeoning number of kraft pulp mills. The second-largest source is bark and woodwaste. Energy costs have moved up to third place, behind fiber and labor, in terms of total cost to the pulp and paper industry. Since 1972, the U.S. pulp and paper industry has cut its use of fossil fuels and purchased energy by about 43%, while pulp, paper, and board production has risen by about 39%.

A survey conducted by the American Paper Institute shows that fossil fuel and purchased energy use by the pulp and paper industry per ton of output dropped from 19.2 million Btu in 1972 to 11.7 million Btu in 1986. Self-generated and residue energy sources, such as wood, bark, and spent pulping liquors, accounted for 56.7% of the industry's total energy consumption in 1986, the API reports. This compares with 40.9% in 1972 and 56.0% in 1985. Consumption of fossil fuels and purchased energy dropped by about 16%, while oil use declined 55% between 1972 and 1986. Natural gas consumption is about 29% below the 1972 level.

Mills in New England, the South Atlantic region, the Southcentral region, and the Pacific and Mountain regions all generated over half of their energy in 1986—the South Atlantic led with 65.0%. Mills in the Middle Atlantic region and the Northcentral region generated about one-quarter of their energy needs, according to the API. Last year, the industry sold 29.9 trillion Btu of energy and purchased 970.0 trillion Btu.

*TABLE 1:* **U.S. energy use per ton of pulp, paper, and paperboard production.**

| | 1986 | 1985 | 1972 |
|---|---|---|---|
| Energy consumption (trillion Btu) | 2,076.4 | 1,979.0 | 1,783.6 |
| Total production (million tons) | 75.6 | 71.2 | 54.5 |
| Energy use/ton (million Btu) | 27.5 | 27.8 | 32.7 |

Source: American Paper Institute.

**PURCHASED ENERGY.** The paper industry purchases about $2 billion worth of electricity annually. Electricity now accounts for about 45% of industry energy purchases, although for only 6.4% of the energy consumed.

Because of the energy crunch of the 1970s, the industry has managed to wean itself of dependence on fuel oil: since 1972, fuel oil use has declined 55%, although production of pulp, paper, and board has gone up 39%. By 1985, annual consumption of spent pulping liquors was equal to about 140 million bbl of fuel oil. According to Ronald Slinn, vice president of the API, making a ton of paper requires about 4.5 bbl of oil. This is more than the amount needed to make a ton of steel. Oil consumption reflects changes in oil prices, so OPEC holds the cards that may reveal future consumption patterns. In 1986, fuel oil accounted for about 8% of the energy consumed by the industry, compared with 7% in 1985.

Since 1981, natural gas use has declined, but it still accounts for twice as many Btus as fuel oil.

Consumption of coal has expanded by about 6%/year since the mid-1970s, and this trend is expected to continue. Coal supplies about 15% of the industry's energy needs and is its third-largest energy source.

**COGENERATION.** The pulp and paper industry leads U.S. industry in cogenerated and self-generated electricity capacity. The industry boasts 7,500 MW of cogeneration capacity, which satisfies about half of its electricity demand. By 1990, about 9,000 MW are expected to be onstream—an increase of about 20%. This follows a 26% increase between 1982 and 1985. Proposed power generation in cogeneration applications filed by the industry in 1984 and 85 was equivalent to about seven 1,000-MW plants, the API reports.

The only cloud on the horizon is a possible change in PURPA—the Public Utility Regulatory Policies Act of

1978. This act requires utilities to purchase and distribute cogenerated power produced by nonutilities at no greater cost to consumers than if the utility had generated the power itself. The API says it has identified some 270 pulp and paper mills, employing at least 155,000 people, in which cogeneration and PURPA play "a significant role in the continued well-being of the facility."

In 1986, about 22,000 MW of cogenerated capacity was operating in U.S. industry; of this, the largest portion—about 35%—belonged to the paper industry. The API estimates another 2,100 MW of potential economical capacity from the paper industry could come onstream by 1990 if PURPA benefits remain in place. (Most of the paper industry's cogeneration facilities are in the South. The new tax law, which reduces tax benefits for capital investment, may crimp some of these plans.)

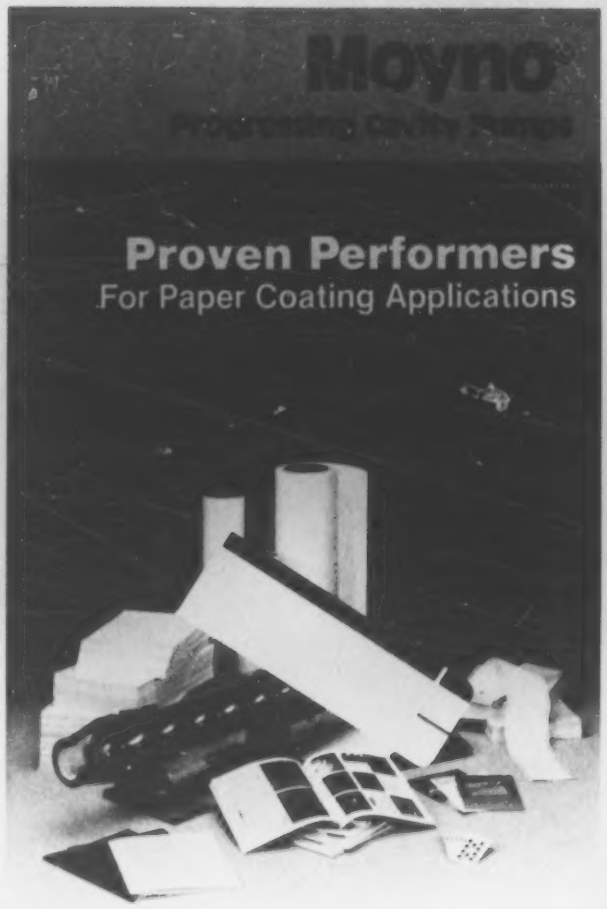
In June 1986, Congress held hearings on PURPA, but these did not result in a new law. Utilities want to limit cogeneration by narrowing the criteria that delineate a qualifying facility. There is also disagreement on the method by which avoided cost is calculated, i.e., the cost incurred by the utility to generate, or buy from another source, the same unit of power that is bought from the cogenerator. Many states are enacting their own laws that complicate the scene further, and some utilities are becoming more vocal in their opposition to PURPA.

In the first half of 1987, the Federal Energy Regulatory Commission conducted meetings to solicit comments on all aspects of Section 201 of PURPA—the section that encourages developing cogeneration facilities. It is hoped that some consensus on the price of power from qualified cogeneration plants will be reached.

Because of changes in the tax law, electric utilities may be able to get away with charging cogenerators from 30% to 80% more to connect to the grid since these fees are now viewed as taxable income. On the other hand, quite a few utilities welcome new cogeneration plants since they eliminate the need for utilities to build costly new power plants of their own.

If push comes to shove, the paper industry may find an ally in environmental groups. Pulp and paper mills need to expend far less incremental energy to make a kWh of electricity in addition to steam than do large utilities. This reduces the amounts of incremental sulfur dioxide and nitrogen oxides that are emitted per kWh. Plus, the paper industry is installing new, more efficient boilers which incorporate fluidized bed boilers, coal gasification, and combined cycle systems that cut down on fuel use and emissions.

**ENERGY PROJECTS.** From the beginning of 1986 through the first quarter of 1987, the U.S. paper industry began the construction of ten new cogeneration plants. Probably the most interesting of these is the alternate energy power plant being constructed at Louisiana-Pacific Corp.'s 600-tpd bleached kraft market pulp mill in Samoa, Calif. (See related story on page 59.) ■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# PULPWOOD COSTS REMAIN DEPRESSED EVEN AS THE DEMAND FOR PULP RISES

## Even the weather is conspiring to help pulp producers earn healthy profits—raw material prices are not responding to increased demand

**By REGINA McGRATH, Assistant News Editor**

Pulp producers found themselves in the enviable position of being able to charge more for pulp while paying less for pulpwood during the first half of this year. Prices for woodchips and roundwood fell throughout 1986 and remained depressed in early 1987.

Although the U.S. paper industry is moving toward a record production year in 1987, the increased demand for raw materials has not driven up prices appreciably, largely because pulpwood supplies were thrown out of kilter by two anomalous events: the 1986 southern pine beetle infestation in the South, and the mild winter experienced in the Pacific Northwest.

Pulpwood consumption in the U.S. amounted to 91.4 million tons in 1986—a 6.6% increase over 1985's consumption level, according to the American Pulpwood Assn. Demand is expected to continue to rise in 1987.

**THE BEETLE PLAGUE.** Last year's southern pine beetle infestation, which ravaged much of the South, caused an oversupply of trees to be harvested as sawmillers attempted to harvest the timber before the bugs did. This created a mountain of chips that only began to erode this winter when rain made logging more difficult. Still, the average price for a cord of southern pine roundwood only rose 1.5% during the first quarter over fourth-quarter 1986, according to *Timber Mart-South*. The price actually fell 4.9% from first-quarter 1986.

Supplies of hardwood in the South are much tighter than softwood supplies, since the wet weather made logging of lowland hardwoods such as oak and gum particularly difficult, especially in southern Georgia and Alabama. Hardwood supplies in central Alabama were described by one source as "adequate but shaky" in the first quarter. A source said some sawmills took downtime in the first quarter because of lack of wood, but logging crews worked overtime to build up shrunken hardwood supplies. Hardwood roundwood prices increased 3.7% from first-quarter 1986, while the cost of hardwood chips was 4.6% higher this year, *TMS* reports.

The flip side of this coin is that the beetles are unlikely to make a comeback in 1987, thanks to the rains.

**TOP-HEAVY NORTHWEST LUMBER MARKET.** The slowdown in logging that normally occurs in the first quarter did not happen this year. The weather was mild, so loggers continued to harvest in the high country. Many sawmills in Washington and Oregon did not take holiday shutdowns or drop any shifts in order to process the timber. Woodchip inventories were therefore not drawn down during the winter but instead were augmented.

The situation was aggravated by the woodworkers' strike that occurred in British Columbia last year. More sawmills in the Northwest increased their operating rates to take up the slack caused by the strike. In general, Douglas fir chips were abundant in the Northwest during the first part of this year, while hemlock and alder chips were in shorter supply.

In retrospect, the strike turned out to be a blessing in disguise. Mills in the Puget Sound, Wash., area, which normally receive many of their chips from British Columbia, instead turned south and bought chips from Longview and Camas, Wash., and from Oregon City and Wauna, Ore. This helped postpone an oversupply of chips that was developing in Washington and Oregon.

For the first half of this year, the export price for Douglas fir chips to Japan remained unchanged from second-half 1986 levels at US$78.40/bdu f.o.b. One

*TABLE 1:* **Pulpwood prices have been weakening for a few years, and now pulp producers are reaping the benefits.**

source indicated that second-half 1987 export prices might decline due to the abundance of these chips.

**TROUBLE IN CANADA?** The abundance of chips was also evident in British Columbia, particularly on the coast. Operators of small, independent sawmills accused major forest products companies of holding the price of woodchips at unrealistically low levels, despite the fact that these companies were earning healthy profits from soaring pulp prices. Sawmills report that they usually negotiate the price of woodchips with major buyers such as MacMillan Bloedel Ltd., Crown Forest Industries Ltd., and British Columbia Forest Products Ltd., but this year they claim the majors refused to negotiate.

According to a report in the *Globe & Mail*, sawmills were invoicing hemlock chips at C$80/bdu but pulp mills decided to pay only $70/bdu. Sawmillers believe another $12 to $15/bdu would even the stakes.

Sawmillers have little room in which to maneuver, however, because of large chip inventories due to the mild winter and strong lumber markets both in North America and abroad. Plus, pulp companies assert that other costs have risen since 1981 and their chip prices are fair. Chip supplies—mostly spruce—were in better equilibrium in interior British Columbia.

**THE 15% DUTY AND CHIP PRICES.** The effect on chip prices of the 15% duty tax placed on softwood lumber going from Canada to the U.S. has been buried under a mountain of chips, most sources agree. In the Pacific Northwest, U.S. sawmills were operating at maximum capacity as they tried to capture market share from Canadian mills saddled with the tax. Canadian sawmills were also operating at full capacity—any lumber they didn't ship to the U.S. could be shipped abroad given the strength of lumber demand in most overseas markets. All of this exerted downward pressure on the price of residual chips: spruce, pine, hemlock, fir, and cedar.

Regardless of the 15% duty, the U.S. market is becoming less attractive to Canadians because of the appreciation of the Canadian dollar relative to the U.S. dollar. This factor has also given U.S. lumber and chip producers an edge in competing for overseas markets.

The 15% fee will not have a major impact on the Canadian sawmill industry, concluded a study conducted by the International Woodworkers of America. The study predicts that fewer than 1,000 jobs are expected to be lost, and this will occur over several years. The study suggests that industry employment on the British Columbian coast may even rise because of increased exports to other markets. ■


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